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Remarks

Claim Status

Claims 38-47 were under examination in the application. Claims 38-47 have been canceled without prejudice to the applicants' rights to pursue the subject matter in a future continuation application and new claims 48-62 have been added. Support in the specification for the new claims can be found as follows:

Support for claim 48 can be found *inter alia* on page 6, lines 3-12; page 7, lines 6-9; page 11, lines 21-29; page 14, lines 10-14; page 18, line 32 to page 19, line 7; page 42, line 30 to page 43, line 8; Figures 1, 2 and 6.

Support for claims 49 and 60 can be found *inter alia* on page 11, lines 10-19 and page 32, lines 5-17.

Support for claims 50-51 and 61-62 can be found *inter alia* on page 10, lines 13-19.

Support for claim 52-59 can be found *inter alia* on page 9, line 25 to page 10, line 11.

Hence, no new matter has been added. Accordingly, Applicants respectfully request that this Amendment be entered.

Claim Objections

Claim 39 was objected to because the recitation "interferon of claim 38 with SEQ ID NO:2" is not clear. The rejection is moot because claim 39 has been canceled without prejudice.

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Rejection Under 35 U.S.C. §112, Second Paragraph

Claims 38-47 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The rejection is respectfully traversed.

The Examiner rejected the claims for reciting "super-compound interferon". To avoid confusion or being vague, the phrase "super-compound interferon" has been deleted from the claims. The claims now recite "a recombinant interferon".

The Examiner rejected the phrase "changed spatial configuration and higher efficacy". Applicants submit that the new claims now recite "the recombinant interferon has different spatial configuration and enhanced biological activity as compared to an interferon not encoded by SEQ ID NO:1 or 3". The specification has clearly described the recombinant interferon of the present invention has different spatial configuration and enhanced biological activity as compared to an interferon not encoded by nucleotide sequence SEQ ID NO:1 or 3 (see e.g. page 11, lines 10-19; page 32, lines 5-17; page 42, line 30 to page 43, line 8; Figures 1, 2 and 6). Therefore, Applicants submit that with regard to differences in spatial configuration and biological activity, the above recitation in the newly added claims has particularly pointed out and distinctly claimed the subject matter of the invention.

The Examiner's other rejections were in claims that have now been canceled without prejudice. In view of the above remarks,

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Applicants respectfully request that the rejection under 35 U.S.C. §112, second paragraph, be withdrawn.

Rejection Under 35 U.S.C. §112, 1st Paragraph

Claims 38-47 were rejected under 35 U.S.C. §112, 1st paragraph, for containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The rejection is respectfully traversed.

As indicated by the Examiner, possession of the claimed invention can be shown by disclosure of complete or partial structure, physical and/or chemical properties, functional characteristics, method of making the claimed product, or any combination thereof. Applicants submit that the specification has provided disclosure of complete or partial structure, physical and functional characteristics, as well as method of making the claimed product.

Claim 48 is drawn to a recombinant interferon encoded by a polynucleotide having a sequence of SEQ ID NO:1 or 3, wherein the recombinant interferon has an amino acid sequence of SEQ ID NO:2 or 4, and the recombinant interferon of the present invention has different spatial configuration and enhanced biological activity as compared to an interferon having an amino acid sequence of SEQ ID NO:2 or 4 but is not encoded by SEQ ID NO:1 or 3. SEQ ID NOS:1-4 was disclosed in Figures 1-2. Differences in spatial configuration were shown in Figure 6 (see also page 5, lines 22-24). Figures 6A-B depict circular dichroism spectrum of INFERGEN™, whereas Figures 6C-D show circular dichroism spectrum

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of the recombinant interferon of the present invention. Both INFERGEN™ and the recombinant interferon of the present invention have the same amino acid sequence, but INFERGEN™ is not encoded by SEQ ID NO:1 or 3. Enhanced biological activity of the recombinant interferon of the present invention as compared to INFERGEN™ was disclosed in paragraph that begins on line 6, page 32.

Claims 52-59 are drawn to a recombinant interferon produced by a method comprising expressing a polynucleotide comprising SEQ ID NO:1 or 3 in suitable host cells. The specification has provided clear and detailed description on such method (see e.g. page 9, line 25 to page 10, line 11; Examples 1-2).

In view of the above remarks, Applicants submit that the subject matter of the claims has been described in the specification in such a way as to reasonably convey to one of ordinary skill in the art that the inventor, at the time the application was filed, had possession of the claimed invention. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. §112, 1st paragraph, be withdrawn.

Rejection Under 35 U.S.C. §102(b)

Claims 38-40 and 44-46 were rejected under 35 U.S.C. 102(b) as being anticipated by Stabinsky et al. (U.S. Patent 4,695,623) or Stabinsky et al. (U.S. Patent 4,897,471) or Alton et al. (EP 422697). The Examiner contends that the cited references disclose an interferon protein sequence that is identical to that of the instant invention, and absent evidence to the contrary, it is expected that the consensus interferon of the prior art would

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have the same functions as that of the interferon of the present invention. The rejection is respectfully traversed.

Contrary to the Examiner's assertion, Applicants submit that the instant specification has provided clear and convincing evidence that show the recombinant interferon of the present invention has different structure and function as compared to that of the consensus interferon of the prior art. The recombinant interferon of the present invention has different spatial configuration and enhanced biological activity as compared to the consensus interferon of the prior art.

First of all, Figure 6 shows that the circular dichroism spectrum of the recombinant interferon of the present invention is different from that of INFERGEN™, which is the consensus interferon disclosed in the cited references. These results clearly demonstrate that the secondary and/or tertiary structure of the instant recombinant interferon is different from that of the consensus interferon of the prior art. (page 5, lines 22-24).

Secondly, the recombinant interferon of the present invention has enhanced biological activity as compared to the consensus interferon of the prior art. Results from Tables 1-3 show that the recombinant interferon of the present invention can significantly inhibit the activity of HBeAg and HBsAg, whereas the consensus interferon of the prior art INFERGEN™ cannot (page 32, Results).

Claims 48 and 52 are drawn to a recombinant interferon having the following limitation:

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encoded by a polynucleotide having a sequence of SEQ ID NO:1 or 3, ... and the recombinant interferon has different spatial configuration and enhanced biological activity as compared to an interferon having an amino acid sequence of SEQ ID NO:2 or 4 but is not encoded by SEQ ID NO:1 or 3.

The cited references do not teach or suggest a recombinant interferon encoded by a polynucleotide having a sequence of SEQ ID NO:1 or 3. Neither do the cited references teach or suggest a recombinant interferon having different spatial configuration and enhanced biological activity as compared to an interferon having an amino acid sequence of SEQ ID NO:2 or 4 but is not encoded by SEQ ID NO:1 or 3. Hence, since the cited references do not teach or suggest each and every aspect of the present invention, the cited references do not anticipate claims 48 and 52. Since 53 to 59 are depending on 52, the cited references cannot anticipate them either. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. 102(b) be withdrawn.

Rejection Under 35 U.S.C. §102(b)

Claims 38 and 44-47 were rejected under 35 U.S.C. 102(b) as being anticipated by Blatt et al. (U.S. Patent 5,372,808). The Examiner contends that since there is no change in the primary sequence, the interferon of the present invention is identical to that of prior art disclosed in Blatt et al. The rejection is respectfully traversed.

As discussed above, Applicants reiterate that although the recombinant interferon of the present invention has the same amino acid sequence as that of a consensus interferon, the

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instant interferon encoded by polynucleotide sequence SEQ ID NO:1 or 3 has different spatial configuration and enhanced biological activity as compared to an interferon not encoded by SEQ ID NO:1 or 3. Differences in spatial configuration and biological activity between the instant interferon encoded by polynucleotide sequence SEQ ID NO:1 or 3 and interferon not encoded by SEQ ID NO:1 or 3 (e.g. INFERGEN™) have been disclosed and described in detail in the specification (Figure 6; page 5, lines 22-24; page 32, Results).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Blatt et al. do not teach or suggest a recombinant interferon encoded by a polynucleotide having a sequence of SEQ ID NO:1 or 3. Neither do Blatt et al. teach or suggest a recombinant interferon having different spatial configuration and enhanced biological activity as compared to an interferon having an amino acid sequence of SEQ ID NO:2 or 4 but is not encoded by SEQ ID NO:1 or 3 as claimed herein. Accordingly, Blatt et al. do not anticipate claims 48 and 52, and Applicants respectfully request that the rejection under 35 U.S.C. 102(b) be withdrawn.

Rejection Under § 103(a)

Claims 38-46 were rejected under 35 U.S.C. 103(a) as being unpatentable over Stabinsky et al. (U.S. Patent 4,695,623) or Stabinsky et al. (U.S. Patent 4,897,471) or Alton et al. (EP

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422697) in view of Nasoff et al. (1999). The rejection is respectfully traversed.

Stabinsky et al. and Alton et al. have been discussed above. The Examiner cites Nasoff et al. for teaching on pBAD promoter.

In contrast, claims 48 and 52 are drawn to a recombinant interferon having the following limitation:

encoded by a polynucleotide having a sequence of SEQ ID NO:1 or 3, ... and the recombinant interferon has different spatial configuration and enhanced biological activity as compared to an interferon having an amino acid sequence of SEQ ID NO:2 or 4 but is not encoded by SEQ ID NO:1 or 3.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2143. Here, the combination of the cited references does not teach or suggest a recombinant interferon encoded by a polynucleotide having a sequence of SEQ ID NO:1 or 3. Neither does the combined references teach or suggest a recombinant interferon having different spatial configuration and enhanced biological activity as compared to an interferon having an amino acid sequence of SEQ ID NO:2 or 4 but is not encoded by SEQ ID NO:1 or 3. Hence, claims 48 and 52 are not obvious in view of the cited references. In view of the above remarks, Applicants respectfully request that the rejection under 35 U.S.C. 103(a) be withdrawn.

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Double Patenting

Claims 38-45 were provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 10/928,956.

Claims 38-45 were also provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1, 5, 12-17 and 21 of copending Application No. 11/077,813.

The Examiner indicates that this is a provisional rejection because the conflicting claims have not been allowed. Accordingly, Applicants respectfully request that the provisional double patenting rejection be held in abeyance until there are allowable claims.

Conclusion

Applicants respectfully maintain that all the grounds of rejections raised in the September 20, 2006 Office Action have been addressed and earnestly urge the Examiner to render favorable action for the claimed invention.